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MARINE CORPS FORCES IN THE FIELD  
WORLD WAR II

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This nation had never participated in any war that necessitated the capture of strongly defended island bases or larger land masses on which an opposed landing had to be made until World War II. There was also very little to be gained by studying previous military engagements of other nations, as the only opposed landing had been at Gallipoli, and this was far from being successful.

The Fleet Marine Forces in conjunction with the Fleet, had made numerous practice landings on islands in the Caribbean Area and although the forces actually landed were small, the lessons derived from these landings proved invaluable. The most valuable information gained from these experiences were the loading problems, equipment and evacuation of casualties. Unfortunately, these landings never included a protracted operation ashore. Had this been done, the problems of messing, sanitation and long lines of evacuation would have brought out many defects. Fortunately, the Bureau of Medicine and Surgery, in 1937, established a board to study, modify and develop the medical equipment and supplies considered necessary for the support of a Marine Division in a combat landing. Even though the equipment was based on experiences derived from World War I, it proved the value of such a study as the equipment developed was fairly satisfactory.

In the fall of 1941 and early in 1942, the First and Second Marine Divisions were activated. The personnel of these divisions comprised some of the best officers and men of the regular Marine Corps plus reserves and volunteers. Their spirit was excellent and they went wholeheartedly into their training. The medical personnel assigned to these divisions, consisted of a few regular Medical Officers and hospital corps personnel, plus reserve Medical Officers and volunteer corpsmen. None of the volunteer corpsmen had ever received any corps school training. The writer was assigned to the Second Marine Division in 1942 and was immediately impressed with the lack of information, both as to the supplies, equipment and function of the Medical Department. These were studied carefully and deficiencies noted. The deficiencies were, mainly, the lack of automotive equipment, instruments for any type of major surgical procedure and the inadequate allowance of medical personnel with front line troops. Additional surgical equipment and supplies were secured from local hospitals but additional automotive equipment and personnel did not become available until late in the Guadalcanal Campaign. In the four months that intervened between the activation of the Division and the departure of the Second Marines reinforced for Guadalcanal, the training was intensive and thorough. All corpsmen were trained in the technique of administering plasma, adequate splinting and the control of hemorrhage. The Dental Officers were trained in administering anesthesia and also to work as a team with the eye, ear, nose and throat men in treating gunshot wounds of the jaws and face. The time and effort spent in this training was quite evident as demonstrated by the highly efficient way in which all medical department personnel conducted themselves. A few practice landings,

made on the beaches of Southern California had been helpful, but here again the troops never made any extended stay ashore and again, many valuable lessons were missed. Realizing the deficiencies of automotive equipment and personnel for evacuation, a jeep was secured and with minor alterations it was converted so it could carry two stretcher cases, two sitting wounded, and the driver. This design was submitted to the Marine Corps Headquarters which, unfortunately, rejected it; however, it was resubmitted and later approved, but not in time for us to take the necessary number of jeep vehicles with us. Just prior to embarking for Guadalcanal, two jeeps were allotted and necessary alterations were made locally. These two vehicles proved invaluable, but many more could have been used. In the late stages of the Guadalcanal campaign, five factory modified jeep-ambulances arrived at Guadalcanal (See picture #1) and were immediately recognized by all as a vital means of evacuation in small island campaigns.

There was no information given the medical department concerning the place and time of the Guadalcanal landing or supporting medical services in the rear so it was only with imagination and watching the newspapers for the extent of the Japanese expansion that we were able to guess where the landing might be made. The National Geographic Magazine furnished the best source of information concerning the south sea islands. A report from the Malarial Commission of the Rockefeller Foundation covering a period from 1930 to 1940 was carefully reviewed, and as a result of this, all available quinine powder and tablets on the Pacific Coast was secured. Many types of capsules were tried in an effort to load the powdered quinine into them but they all congealed in temperatures over 90°F. The powder, therefore, had to be taken in bulk form. This proved to be a great

handicap in the administration of prophylactic doses. In addition to securing large amounts of quinine, we also received sufficient amounts of brandy in two ounce bottles to last five thousand men six months. As will be noted later, this brandy reduced to a small number, the cases of war neuroses that developed during the campaign. When estimating other supplies, we fortunately anticipated treating casualties from damaged or sunken naval vessels in our vicinity, and as a result, took along additional supplies of blood plasma and large battle dressings. We embarked on 1 July 1942, and with the exception of the Friendly Islands, did not touch land again until 7 August 1942. All ships were over-crowded and living conditions were unsatisfactory. During the voyage, all personnel were lectured on First Aid, including administration of morphine and all sanitary measures were gone into thoroughly. Water, food, and the disposal of waste was particularly stressed. The only protection against mosquitoes was clothing, a head net and a cot-type mosquito net. The futility of issuing head nets and mosquito nets to front line troops was realized and eventually, the only personnel that could use mosquito nets were those in rear areas and field hospitals.

On 7 August 1942, the First Marine Division reinforced, landed on Guadalcanal, Tulagi and adjacent small islands. The landing at Guadalcanal was virtually unopposed so all personnel and equipment got ashore and the medical units were well organized before much enemy resistance was encountered. At Tulagi, the situation was different. This landing developed stiff enemy opposition and the casualties were moderately high for three days. It was here that the medical department met it's first real test. Fortunately, the island was small, lines of evacuation short

so that all casualties reached their combat transports within a short time after being wounded. It was here that two major defects were noted; first, there were no facilities available whereby a casualty could be taken care of at night, and evacuated. A few small blackout First Aid Stations were constructed with blankets. This defect was corrected in later operations by the designing of excellent blackout plasma tents at the Field Medical Research Laboratory in Camp Lejeune. The second defect demonstrated that line officers and men alike disregarded all rules of sanitation. The local water supply was destroyed during the engagement and the personnel drank water from any source available. The dead, both our own and the enemy, were not buried as soon as possible, and as a result flies increased very rapidly. The human waste was deposited any place and this materially increased the number of flies so that within a week diarrhea appeared. It was fortunate that the enemy had no forces to counter-attack at this time. As a whole, the medical aspects of the operation were successful, particularly the low death rate from wounds, as adequate amounts of plasma and sulfa were administered early. On Guadalcanal, because of the larger land mass, defects in sanitation were not penalizing. Within a few weeks of landing on Guadalcanal, numerous cases of malaria began to develop, but, fortunately, we had adequate amounts of quinine and some atabrine. All cases were thoroughly and properly treated.

In September, Commander Sapero, came into the area as Malaria Control Officer on ComSoPac Staff. He advised that atabrine prophylaxis of four tablets weekly be started. This was difficult to do in combat as the line officers and enlisted men had no training in this procedure, also word got around that atabrine damaged the liver and decreased sexual

powers, but by diligent effort this fear was gradually overcome. In spite of the atabrine prophylaxis administered, the number of cases of malaria continued to increase. By November, 1942, 16% of the combat troops were ineffective; 4% from wounds and 12% from malaria. On 15 November, the Second Regiment was started on 1 tablet of atabrine a day per man. Within two weeks the number of admissions of malaria had decreased over 50%. This was not approved by the Malaria Control Officer and was not reported at this time because of specific instructions not to give more than four tablets per week. From 1 December on, all Marine troops coming in the area were put on the regime of one atabrine tablet per day, and from then on the number of combat troops ineffective because of malaria was less than 5%. A small supply of mosquito repellant, "Skat", was provided in the middle of December, but because of skin irritation and rapid evaporation, it could not be used effectively in the heat.

During the Guadalcanal campaign, new surgery techniques were developed that resulted in the saving of many lives. In the matter of plasma and blood transfusions it was early discovered that giving plasma and blood in one or two veins was not sufficient to overcome the severe shock and blood loss that followed gunshot wounds to the liver and kidneys. As a result of this experience, a four way infusion was developed that proved to be the answer to this particular type of case. In these liver and kidney wounds, all four extremities were used to give infusions. Plasma was given in both arms and one leg and saline and glucose in the other leg. While this was going, blood donors were secured from troops in the rear areas and as soon as cross matching was completed, citrated blood was substituted for the plasma. The first patient on which this new technique

was employed was an aviator who had made a crash landing on a beach near one of the field hospitals. He had a tremendous jagged wound extending from the twelfth dorsal vertebra around nearly to the umbilicus. The patient was cut almost in two. Someone had jammed a shirt into his side and as the patient was brought into the field hospital, pressure was maintained on the shirt. When he arrived, no pulse could be felt in the wrist and it looked as if the patient would die any minute. The four-way infusion described above was started by cutting down on the veins in all four extremities and the petcocks on the infusion sets were opened wide. Within fifteen minutes the pulse began to reappear in the wrists. Blood was substituted for the plasma as soon as it was obtained and in an hour and a half the blood pressure had risen and stabilized around 110/70. The four way infusion was continued for another half hour and the patient prepared for surgery. During this period of preparation the patient received eight units of plasma, nine pints of blood and two thousand cc of saline glucose. While on the operating table the patient received two pints of blood and two units of plasma. On the operating table it was discovered that he had the lower pole of his left kidney severed and the descending colon was cut nearly half in two. Strips of muscles were plicated over the lower pole of the kidney to control bleeding; the descending colon was brought up and a colostomy was established. During the post-operative period the patient was given three more pints of blood plus saline and glucose. After the third day he was convalescing satisfactorily. This patient was seen three months later in a base hospital and he was healed except for a small draining colostomy. This case is described in detail as it is believed to be the first time a four way infusion had ever been



used and such large amounts of plasma and blood were given in such a short interval. The four way infusion technique was later used on other wounds of the liver, kidney and other abdominal viscera with complete success.

Since it had been anticipated that naval casualties would have to be treated in the forward areas, we decided to use 5% sulfanilamide ointment locally with compress dressings plus plasma and saline and glucose. About twenty four hours following the sinking of one of our large carriers, we received seventy-six patients that had between thirty and fifty percent of their body areas covered with second degree burns. Many of these patients had been burned while swimming thru flaming oil and most of the burned areas were on their legs, arms, upper chest areas and faces. The seventy-six burned and wounded cases received an average of four thousand cc of plasma and two thousand cc of saline and glucose in the first seventy-two hours. The plasma and saline and glucose was given mainly by the femoral vein route. These patients were all treated on cots in a field hospital where treatment was continued two weeks before they were evacuated. There were no deaths. Since large amounts of sulfanilamide ointment was being used locally, enough fluid was given to insure a minimum of one thousand cc of urinary output each twenty four hours. The burned and wounded areas were clean and no secondary infections had developed at the end of two weeks. This is also reported in detail because it is believed to be the first time any large number of severely burned and wounded patients had been treated by sulfanilamide ointment and plasma under combat conditions. It is felt that five percent sulfanilamide ointment can be safely used over a large burned area if adequate fluid

balance is maintained. Under field conditions, when a large number of casualties are received, it is impossible to administer sulfa or other drugs orally, or otherwise, because sufficient medical personnel are not available.

The recording of casualties evacuated from a combat area is one of the most important functions of the Medical Department, both in the forward and rear areas. In the forward area we maintained a running record of all personnel evacuated, simply listing their name, rank or rate, serial number, diagnosis and date of evacuation. The original and one copy was sent to the Senior Medical Officer on the staff of the Admiral in Command of the area and one copy to the Rear Echelon to which the patient was attached. Unfortunately, because of lack of coordination in the rear areas, large numbers of patients were lost track of and it was most difficult to find out if our personnel had been evacuated to the United States or whether they were still in base hospitals in the rear. Since all health records, pay accounts, service records and personal effects were left in the rear areas, it became a tremendous task to try to get the patient, his personal effects and records together. Although attempts were made to establish casualty clearing sections in later campaigns the problem was never adequately solved. Both the Bureaus of Personnel and Medicine and Surgery were harrassed by inquiries concerning the wounded; where they were and how they were getting along. A thorough study of this casualty recording and reporting should be made and an adequate organization developed so as to prevent this confusion in any further conflicts.

The establishing of a satisfactory operating room in combat

was found to be particularly difficult with the equipment supplied, that is; a tent, light portable operating table and a battery spot light. The tents could not be blacked out and there was no protection against flies and mosquitos, making clean surgery next to impossible. A portable ply-wood, 16' x 16', hut was finally secured from an air craft tender and proved to be ideal for an operating room. This hut, known as the "Dallas Victory Hut", was well screened, had flaps for blacking out and a good solid oak floor. Following the Guadalcanal campaign, each Medical Company was supplied with one of these portable operating rooms. In the later campaigns it was found possible, by pre-sterilizing instruments, to have the portable operating room set up and functioning within six hours following the landing of a Medical Company. In 1944, the Marine Corps Headquarters had several contractors develop portable ply-wood, 16' x 16', huts, and as a result of this, two firms developed 16' x 16' huts that weighed about twelve hundred pounds, could be erected in two hours by four men, and could be shipped in a package 4 x 4 x 8 feet. Future developments along this line should be encouraged as the use of these plywood operating rooms proved to be the only way that satisfactory major surgery could be provided for the patients in the field.

Medical Department brandy in two ounce bottles was first used in the field in the Guadalcanal campaign. Each aid station and field hospital was supplied with brandy so that the Medical Officer could administer this to patients that seemed doomed to become casualties due to fear and combat fatigue. The Medical Officer used four ounces of brandy to each canteen of water. Two or three swallows of this given to a patient who was dehydrated and who had an empty stomach was usually sufficient to

put him into a sound sleep. Following this, he would be ready to go back to the front lines again. With some patients this procedure had to be repeated two or three times but in no instance did we find a patient trying to take advantage of the situation. It is believed that this is the first time brandy had been used to control the fear and hysteria of combat and it was successfully used throughout the remaining campaigns.

Near the close of the Guadalcanal campaign, a Medical Department combat landing plan was developed listing supplies and equipment to be landed with each Medical Unit. Also a diagram showing the Medical Department personnel and lines of evacuation from the front lines back to the rear areas and evacuation points. This plan was a great aid in coordinating the Medical activities in a division and also provided for better teamwork between the forces ashore and the supporting amphibious forces. This combat landing plan was later used by the Marine Corps Divisions with slight modifications for each campaign and also was used as a training guide in the Field Medical Schools.

The First Marine Division and the Second Marine Division were sent to Australia and New Zealand respectively for reoutfitting and reorganizing. The men arrived in these countries with only khaki clothing. The climate in these two areas was cold and rainy and there was not enough coal available to adequately heat their living quarters. Woolen clothing was supplied as soon as possible but there was never enough coal to heat the buildings and tents in which they were quartered. Six weeks following the arrival of the Second Marine Division in New Zealand, an average of two hundred and fifty cases of malaria were being admitted each day from the thirteen thousand men that had been in the Guadalcanal area. This

high admission rate severely taxed the field hospitals and the base hospital at Wellington. The average case of malaria was only hospitalized for one or two days after the patient's temperature had returned to normal. Had there been more information on the prolonged use of atabrine as a suppressive agent, this high admission rate could have been materially reduced. Hence, no suppressive therapy was used and each admission was treated with quinine or various combinations of quinine and atabrine. Atabrine therapy alone was also used. In spite of the various malaria drugs used, the admission rate remained high. Therapeutic studies were started on two battalions that had been in the Guadalcanal area under similar conditions an equal length of time. One battalion treated all new admissions with thirty grains of quinine for ten days followed by ten grains for thirty days. The other battalion treated all new admissions with six tablets of atabrine for three days, three tablets a day for seven days, followed by one tablet a day for thirty days. These battalions were followed for two months and in the battalion receiving the atabrine therapy, the re-currence rate was nearly seventy percent less than in the battalion receiving the quinine. This convinced us that atabrine was the drug of choice in treating malaria. Nearly all smears in these recurrences disclosed Plasmodium Vivax. In a few patients a mixed infection was present; the smears showing Plasmodium Malariae and Plasmodium Vivax. However, four months after leaving the Solomon Islands, all smears revealed only Plasmodium Vivax.

In July of 1943, the Second Marine Division received orders to prepare for the attack and capture of Tarawa in the Gilbert Islands. The Division Surgeon was one of the eight staff members included in the advance

planning and this greatly contributed to the excellent showing made by the Medical Units during the capture of Tarawa. The Medical Combat Landing Plan was thoroughly indoctrinated in all Medical Sections as well as the line units. Intensive drills were held, both day and night, with all the Medical Sections assigned to each Regimental combat team. Supplies were rather difficult to secure but finally six thousand units of plasma were procured and all Corpsmen were trained to give plasma. A supply of boat bags was also procured and packed with essential first aid items, such as plasma, battle dressings, sulfanilamide powder and splints. These boat bags proved to be a great aid in landing medical supplies as a Corpsman could easily carry this bag ashore in addition to his personal equipment.

By the 22nd of September 1943, the Division was admitting seventy cases per day for malaria. All personnel were immediately started on suppressive atabrine therapy of one tablet per day per man. At the end of the third week we were only admitting twelve cases a day for malaria. On the first of November 1943, the division embarked aboard the transports, and by that time only eight malarial cases were being admitted daily. On November 20th, D-day, no patients were left aboard ship because of malaria. During the attack on Tarawa, there were only five admissions for malaria and only two of these were returned to the transports.

The Transport Divisions arrived in Wellington early in October and between that time and our sailing date of 1 November, each combat team had two practice landings. As no amphibious force Surgeon was present, the Division Surgeon was assigned the additional duty of training and coordinating the Medical Department's of the transports. This aided

greatly in the smoothness of the plan as all Medical Department personnel from the front lines back to and including the transports, knew what their functions were and knew, also, how all the units were to function.

The problem of sanitation was carefully considered and all landing personnel were thoroughly indoctrinated in the proper disposal of galley and human waste. All drinking water was placed in five gallon cans and salted just prior to the landing. As a result of this careful and thorough indoctrination in regard to sanitary measures, there were no admissions for gastro-intestinal complaints. There were, however, a few admissions for heat exhaustion in one batallion which was found later not to have carried out the order to salt the drinking water.

The problem of disposing of the dead on Tarawa was thoroughly considered beforehand. Intelligence reports indicated that there were approximately four thousand enemy troops on Tarawa, an island only one half mile across at the widest point, and two and a half miles long. Our experience from previous operations made us realize that we would have the bodies of nearly all of the four thousand enemy troops to dispose of in addition to our own dead. Three methods of disposal of the dead were considered; first; to take all bodies out to sea and weight them for sea burial, but this was not considered to be practicable because of the large number of boats required in addition to the working parties. Second; cremation of the enemy dead was considered as this was the common practice of the Japanese. This, too, was considered impracticable because of the large amounts of fuel oil necessary and the length of time required for cremation. A third method of disposal was finally agreed upon. Our own dead were to be buried in long graves made by bulldozers. For the enemy



dead we decided to use bomb craters, as a large serial assault was planned, using five hundred and one thousand pound bombs. This proved to be quite satisfactory as the water level was only six feet below the ground level. These bomb craters were then covered over by bulldozers. The plan was well conceived but was carried out under great difficulty. Most of the bodies had been exposed to the heat from four to seven days before we were able to get to them and the odor was almost beyond human endurance. The working parties of three hundred men would start dragging bodies out of dugouts and gun positions and within an hour all of them would become so nauseated they could not continue. However, within a week, all exposed bodies on the island had been buried. From the sea, bodies kept washing up on the beach and as these were our own dead, they were promptly buried in individual graves. All this disposal of the dead had to be carried out by the assault forces that had been thoroughly exhausted by four days and nights of a terrific fight. Our own assault forces readily helped in burying our own dead but were bitterly opposed to burying the enemy dead. In conference with the high Naval Command in Pearl Harbor, following this attack, it was finally agreed that an additional battalion, Sea-bees or other groups, should be assigned the sole duty of disposing of the dead in future operations, in conjunction with the grave registration units.

On November 20, 1943, the attack on Tarawa was started. Long range gunfire from the beach disrupted the unloading of the assault troops, so that H-hour had to be postponed about two hours. One hundred and twenty-five amphibious tractors were utilized in landing the initial assault companies. As the assault waves approached Red Beachs 1,2, and 3, they met with a



withering gunfire of all calibers from the shore. (See attached map) A large number of the amphibious tractors received direct hits but some were able to continue. Heavy casualties, ranging from fifty to seventy percent occurred in all the assault companies. Very few men reached Red Beach-1 and most of these were wiped out by the end of twenty-four hours. The landing on Red Beach-3 was repulsed with heavy losses. By noon of D-day between two and three hundred troops had secured a small area on Red Beach-2 adjacent to the pier. A small number of troops were landed on this beach in the afternoon and evening of D-day so by the morning of D-day-plus-one about one hundred yards of the beach had been secured but only to a depth of twenty-five to seventy-five feet. During this period the only medical supplies available were those that were carried in by Medical Department personnel in kits or boat bags. Because of the terrific number of casualties occurring, no organized evacuation could be effected at this time, but casualties were evacuated as rapidly as possible by any and all hands available direct to AP's. They started arriving on the AP's at 1100 on D-day and evacuation continued throughout that day and into the night by amph-tracks or any other type of boat available. By the morning of D-day plus one, two main points of evacuation had been established and were functioning smoothly.. One in the center of Red Beach-2 and the other at the end of the pier. The writer landed at the end of the pier about 1100 on D-day, and organized the treatment and evacuation of the wounded from that point, finally cleaning up all the casualties in the area by late that evening. On D-day plus 1, additional troops began to land on Red Beach-2 and fanned out toward both Red Beach-1 and Red Beach-3. By this time additional medical supplies had been secured and

and all casualties were receiving adequate amounts of plasma before being evacuated. All casualties occurring in the vicinity of Red Beach-2 and those occurring on Red Beach-1 were evacuated by amph-tracks to the end of the pier where medical sections from two transports gave additional plasma and transferred the casualties from amph-tracks to boats and back to the transports. Evacuation from Red-Beach-3 was made via rubber boats passing along the west side of the pier where they were reboated and transferred to Higgins' boats. On D-day plus 1, casualties were evacuated from Red Beach-1 on amph-tracks and from D-day plus one on, the evacuation was made either to Red Beach-2 or Green Beach. On D-day plus 2, the Sixth Regiment landing on Green Beach had but few casualties. This regiment proceeded up the south side of the airstrip and evacuated their casualties to Green Beach until reaching the area directly across from Red Beach-2 and then the casualties occurring from here on to the east were evacuated via jeep-ambulance and amph-tracks to Red Beach-2. On D-day plus 3, evacuation was possible to the end of the pier by jeep-ambulances.

On D-day plus 2, Companies A and B of the Second Medical Battalion were ordered ashore on Betio and Bairiki Islands, respectively. Both of these companies established blackout surgeries and were ready to operate six hours after landing. By the above evacuation approximately two thousand five hundred casualties were evacuated during the four days of the attack. During this evacuation nearly four thousand units of plasma were used or an average of a little less than two units of plasma for each casualty. A large percentage of this plasma was administered by Corpsmen and it is felt that the time spent in training these corpsmen to give plasma was largely responsible for the low death rate of only 2.3

percent of those wounded.

On December 7, 1943, I saw approximately five hundred casualties in the Naval Hospital at Aiea Heights, T. H. After questioning many of them I found that some had arrived aboard the transports within one hour after being wounded and a few others arrived as much as twelve hours after being hit. The abdominal wounds that I saw had been evacuated promptly, as all medical personnel of the division had been so directed.

The low death rate of 2.3 percent of the wounded during the Tarawa campaign was believed due to several factors: First, the heroic work of the doctors and corpsmen under terrific odds; second, the use of such large amounts of plasma during the evacuation and third, the thorough indoctrination of all medical sections including the transports in the medical plan.

Air evacuation was not employed at Tarawa as it did not become available until D-day plus five and by that time all casualties had been evacuated to the transports.

The plan to have a Senior Medical Officer from the Transport Divisions on the control ship to properly distribute the patients to the transports was not carried out in the Tarawa operation. This resulted in several of the transports being overloaded with casualties and also in an uneven flow. Some of the transports received from fifty to seventy five casualties in an hour or two which caused some delay in treatment. It is essential that a Senior Medical Officer be assigned to the control ship who is thoroughly acquainted with the capacity and capabilities of the staff of each transport.

The use of APH's in an attack is considered highly desirable as

this type of ship can carry in assault forces and has a complete staff of specialists and large sick bays so that specialized treatment can be afforded as needed. The use of AH's is also highly desirable but since they cannot go into the transport area until D-day plus 1 or later, it is seldom possible for them to receive casualties direct from the beaches and therefore, their main function is only that of relieving the overloaded transports of casualties for evacuation to base hospitals.

In the Mariannas campaign, an attempt was made to use Medical Officers aboard control vessels. These Medical Officers were not assigned until the last minute and as a result did not know the capability of the Medical Sections and capacity of the transports employed. Air evacuations from the Mariannas campaign were started on D plus 14. At first in these air evacuations, the casualties were not properly screened and many were evacuated who were in poor condition, resulting in several near fatalities that could have been avoided. In the Guadalcanal campaign, all casualties who were to be evacuated by air were properly screened and all arrived at the base hospitals in good condition.

The Medical Department with the landing forces in the Mariannas functioned in a highly commendable manner. Unfortunately, many of the jeep-ambulances assigned to the divisions were not loaded and as a result, evacuation of casualties from the forward areas was unnecessarily delayed. In the Mariannas campaign, the operation on Saipan was the first time that we had employed any large force in such a large land area. In the operation it became apparent that mobile surgeries were necessary so that the Medical Department could keep up with the rapidly advancing attack. Following this operation, recommendations were made for a complete mobile surgery.

As a result of these recommendations, the Bureau of Medicine and Surgery and the Marine Corps developed an air conditioned surgery in a trailer, eight by eighteen feet, complete with sterilizing equipment. (See pictures #2 and #3) The Marine Corps furnished the trailer with air conditioning equipment and the Bureau of Medicine and Surgery furnished the sterilizer bank, operating table, operating lights and all types of surgical equipment. Because all units to go into this trailer had to be specially designed and manufactured, it was nearly one year before these surgical trailers reached the field. As a result, these surgical trailers were not used in the Iwo Jima or Okinawa campaigns but were ready for use for the attack on the Japanese mainland. It is felt that continued study and improvements in this mobile surgery is highly desirable.

As a result of our experiences in the Tarawa and Mariannas campaigns, amphibious trailers originally designed by the Marine Corps to land essential supplies and equipment were converted into armored amphibious sick bays. These armored sick bays were designed to give protection to the casualties in battalion and regimental aid stations from shrapnel and small arms fire. They were also designed so that they could be loaded with large amounts of supplies and medical equipment, hauled ashore by amphibious tractors and were then immediately available to properly care for a large number of casualties. The accompanying pictures (#4 to #7) show the interior in detail and how these armored amphibious sick bays can be blacked out. These armored amphibious sick bays are considered a prime requisit in the handling of casualties near the front lines. It not only affords maximum security for the Doctors, Corpamen and patients, but also serves as an excellent means of landing adequate medical supplies and

equipment. If these armored amphibious aid stations had been available at Tarawa, adequate Medical supplies would have been available early, even if only one or two were successfully landed. They certainly would have been ideal for the landing at Iwo Jima, where the aid stations on the beaches were under fire for several days. This picture, (#8), shows the average battalion aid station in combat which is without protection for the patient being treated or the personnel giving the treatment.

After the Guadalcanal and the Tarawa campaigns, it became evident that certain additional medical and surgical specialists should be assigned to the Marine Corps Divisions. As a result of the requests coming in from the field, one psychiatrist and one ophthalmologist were added to the Headquarters Company of each Medical Battalion. This additional medical personnel was first employed in the Iwo Jima campaign. The operations reports indicated that the psychiatrists were able to segregate and control evacuation of all neuropsychiatric cases. This took a great work load off of the other medical officers who were then able to concentrate on the care of the wounded. The work of the ophthalmologist also afforded much better care for the eye wounds in this highly specialized field.

The Hospital Corps Pouch furnished to the Medical personnel attached to the Marine Corps was too narrow and too deep. Following the Tarawa operation, a study was started at the Field Medical Research Laboratory at Camp Lejeune to develop and improve the Hospital Corps Pouch. A modification of the Navy Hospital Corps Pouch was developed and adopted that made all supplies accessible, with separate compartments for morphine syrettes and other small items.

Early in the war, the Sick Call cases furnished with the field medical equipment were found to be highly unsatisfactory. These sick call cases were simply fibre suit cases which were easily broken, were not water proof, and when opened, the contents were all askew. Late in the Guadalcanal campaign and following it, sick call cases were developed by using a standard Marine Corps field desk. Separate compartments were built into these field desks for standard size ointment jars and bottles. When the desk was opened up and the legs extended, it made the needed equipment immediately available. This type of sick call case, developed in the field, was later modified at the Field Medical Research Laboratory and became a part of the field equipment issued to all Medical Units with Marine Divisions.

Early in the war, a novel operating room light was developed in the field that proved far superior to anything that had been furnished. This was done by opening up the four sides of a five gallon gasoline can to a 45° angle. This was then suspended over a Kollman gasoline lantern and the four way reflection from the sides of the gasoline can gave a brilliant, and practically shadowless light.

The Okinawa campaign again proved a severe test of the Medical Department's ability and equipment. The Medical Plan was brilliantly conceived and all contingencies were well covered. The mistake made in the Mariannas campaign of not furnishing medical personnel and equipment to care for the native population was not repeated at Okinawa. The civil government units and Medical Department organizations were organized and trained well in advance of the operation. These units functioned very efficiently during and after the campaign so that the



Medical Units with the assault forces were not over run with native casualties and sick as they were on Saipan. The Medical Companies and Corps evacuation Hospitals attached to the Marine Divisions effectively used their portable plywood surgeries plus two surgical trailers that had been converted in the field. This equipment, in addition to the full allowance of jeep and field-ambulances aided materially in the fine surgical care and rapid evacuation of the wounded throughout the Okinawa campaign.

An effort has been made to show that, with ingenuity, the lack of suitable equipment can be overcome in the field. It seemed to us, who were working in the field, that our recommendations on modifying and procuring new equipment were very slow in being accomplished. However, the writer found, after his assignment in the Bureau of Medicine and Surgery, that to develop a new item of equipment, it took from six months to a year from the time that the idea was conceived until its delivery in the combat zone. These delays, of course, were caused by the shortage of certain critical materials and manufacturers being overloaded with contracts.

It is sincerely hoped that a continuous study will be conducted to improve and develop new items of Medical equipment and supplies so as to keep pace with the new war techniques.



1 April '43

SOP)  
: EMPLOYMENT OF MEDICAL UNITS  
)

1. The following are basic instructions for the Amphibious Employment of med units of this Div.

2. GENERAL PRINCIPLES

a. Medical Supplies:

- (1) Combat Loaded.
  - (a) Initial requirements to be available for debarkation with med pers.
  - (b) Remainder to be unloaded with CT material.

b. Medical Personnel:

- (1) Combat Loaded.
  - (a) CT and LT Pers normally will be with their Orgn Hq(ANNEX "A").
- (2) Will be equipped with shoulder holster and a pistol for self-defense when directed.

3. SHIP-TO-SHORE

a. Med Pers will land as follows:

- (1) In approximately same wave as Hq to which atchd.
  - (a) Co Aid Corpsmen.
  - (b) Bn Aid Sta.
  - (c) Regtl Aid Sta.
  - (d) Med Pers with Div Trs.
- (2) Earliest possible time following SP Command Group:
  - (a) SP Med Pers.
  - (b) Coll Sec.
- (3) When tactical situations permit.
  - (a) Hosp Sec.
  - (b) Med Bn.
  - (c) Mal Cont Unit.

b. Supplies and Equipment (paragraph 6)

4. ASHORE

- a. Co Aid Corpsmen will give wounded emergency treatment in Co Zone of Action.

SOP (CON'T)

b. Bn Aid Sta will evacuate casualties from front line to Bn Aid Sta, treat and prepare casualties for future evac.

c. Regtl Aid Sta will establish near Regtl CP and along line of drift from Bn Aid Sta.

d. LT SP (Med) will be composed as follows:

- (1) Coll Sec Med Co: 1 Med O, 11 Corpsmen, 3 Marines, and 1 Jeep Ambulance (combat loaded).
- (2) Pion Plat: 1 Corpsman.
- (3) APA: 1 Med O, 8 Corpsmen.

e. The following are assigned duties at SP Aid Station.

(1) Med O (Coll Sec Med Co): Segregation and treatment of patients at SP Aid Sta.

(2) Med O (Pion Co):  
(a) Coordination of evacuation stations and report to Div or SP Comdr. on evac.  
(b) Treatment of casualties occurring in his immediate area.

(c) Designation of Corpsmen to record patients evacuated to APA and also 1 Corpsman on APA to record patients received. (Date to include Name, Organization, Diagnosis and Serial Number)

(3) Med O (Coll Sec) and Med O (Pion Co): Litter, blanket and splint exchange.

(4) Med Sec (APA): Evacuation by boat to APA, and in addition assist Co 1 Sec.

f. Coll Sec and SP Med Pers: Establish such emergency Field Hospital as necessary to care for casualties after the APAs depart and before Hosp Sec can establish Field Hospital.

g. Hosp Sec: Set up Field Hosp, receive, treat, and prepare casualties for evac.

h. Med Bn (less 3 Cos):

- (1) Establish Div Hosp and be prepared to receive, treat, and evacuate patients from units in the area, or to relieve other Med Cos when necessary. Thier ambulances will be available to aid casualty evac from all units, which they serve. When established, the following will be notified:
  - (a) Div Surgeon via CO, Med Bn
  - (b) Any unit served.

i. Malaria Control Unit will unload on order. For Duties, see SOP Malaria Control.

5. INSTRUCTIONS TO MEDICAL PERSONNEL

a. Employment in Combat:

(1) No Med O will be assigned to a unit smaller than a Bn except Med O in Pion Bn.

(2) Med O will remain with respective Aid Stations during combat

(3) Med Pers will take same precautions regarding concealment, camouflage and local security as combat troops.

b. Handling Casualties:

(1) Attach EMT to all casualties when first treated. Fill in name, organization, nature of wound, and treatment.

(2) Bn, Regtl, and SP Med Sec will log all casualties passing through, showing name, organization, nature of wound, injury or sickness, and disposition. All information concerning killed will be recorded.

(3) SP Med Sec will classify wounded in accordance with method of transportation and expected recovery.

(a) Ambulatory.

(b) Litter.

(c) Non-transportables.

(d) Patients who will become effectives in 10 days will not be evacuated.

(4) Casualty reports will be made through normal channels to Div.

c. Chain of Evacuation:

(1) Through Bn Aid Station via Regtl Aid Station to beach, to APA or hospital.

d. Exchange of Supplies:

(1) Particular attention will be given to exchange of litters, splints, dressings, and plasma between Bn and Regtl Aid Stations, SP Med Sec and ship or hospitals.

e. Disposition of Dead:

(1) All dead will be tagged, collected at Bn Aid Sta, and disposed of as directed.

(2) The Graves Registration Section plus 2 dental technicians from CT will function under direct control of the Chaplains. Two Form "N" will be prepared, and in the case of dead who cannot be definitely identified otherwise, Form NMS R-4 (Dental Chart) will be prepared and securely attached to original certificate of death.

6. SUPPLIES AND EQUIPMENT

a. INDIVIDUAL:

- (1) Med O . . . . . Unit One.
- (2) Dental O. . . . . Unit Two.
- (3) Corpsmen (Med). . . . . Unit Three.
- (4) Corpsmen (Dental) . . . . . Unit Four.

b. Battalion Aid: (Inf)

- (1) Two Jeep Ambulances.
  - (2) Units 1 to 5 inclusive, 3 each of units 6 & 7, 4 unit-9  
1 unit-10.
  - (3) Sickcall chest.
  - (4) Bulk supplies. (Packed in waterproof pouches)
    - (a) Battle dressings, large. . . . . 100
    - (b) Battle dressings, small. . . . . 500
    - (c) Benzedrine. . . . . 1000 tablets
    - (d) Morphine syrettes, packet. . . . . 50
    - (e) Plasma. . . . . 60 units.
    - (f) Plastic leg splints. . . . . 12
- (Bn Aid Sta will be divided 3 ways and loaded in landing craft.)

c. Regimental Aid: (Inf)

- (1) Same as Bn Aid (Inf).

d. Artillery Regt: H&S and Arty Bns.

- (1) Same as Bn Aid (Inf) less 1 Jeep Ambulance and ten canvas  
litters.

e. Special and Service Troops:

- (1) Same as Bn Aid (Inf) less Jeep Ambulance. Twelve folding  
litters in place of canvas litters.

f. Collecting Section: (Med Co)

- (1) Same as Bn Aid (Inf) less 1 Jeep Ambulance and sickcall  
chest. Twelve folding litters in place of canvas litters.
- (2) Additional Aid Sta Equipment - 120 units of plasma, 5  
expeditionary cans, 1 lister bag, and 1 utility box.
- (3) 20% bulk supplies of Med Co.

SOP (CON'T)

f. Med Co: (less three collecting sections)

(1) Initial Group:

- (a) 1 Jeep Ambulance, \*Combat loaded.
- (b) 2 LxL, one ton truck, \*Combat loaded.
- (c) 2 Field Ambulances, \*Combat loaded.
- (d) 1 Trailer, water.
- (e) 1 One ton trailer, cargo.

\* This equipment will include portable surgery with necessary instruments and sterile packs to enable them to perform abdominal surgery within first 24 hours; 50 stretchers, 50 blankets, 50 cots, and 4 tarpaulins.

(2) Secondary Group:

(a) Remainder of equipment and supplies of 72 bed hospital included in #1 priority.

(3) 40% bulk supplies of Med Co.

g. Medical Battalion: (Less 3 Med Cos)

(1) H&S Co:

- (a) 1 Jeep.
- (b) Office equipment.

(2) Two Companies, (Med):

(a) Supplies and equipment for two Med Cos. When additional Med Co is assigned to Inf Regt or Arty Regt, their supplies and equipment will be divided as Med Cos normally with Inf Regts.

F. R. MOORE,  
Captain (MC) USN,  
Division Surgeon.

ANNEX "A" TO )

EMBARKATION PLAN.

SOP

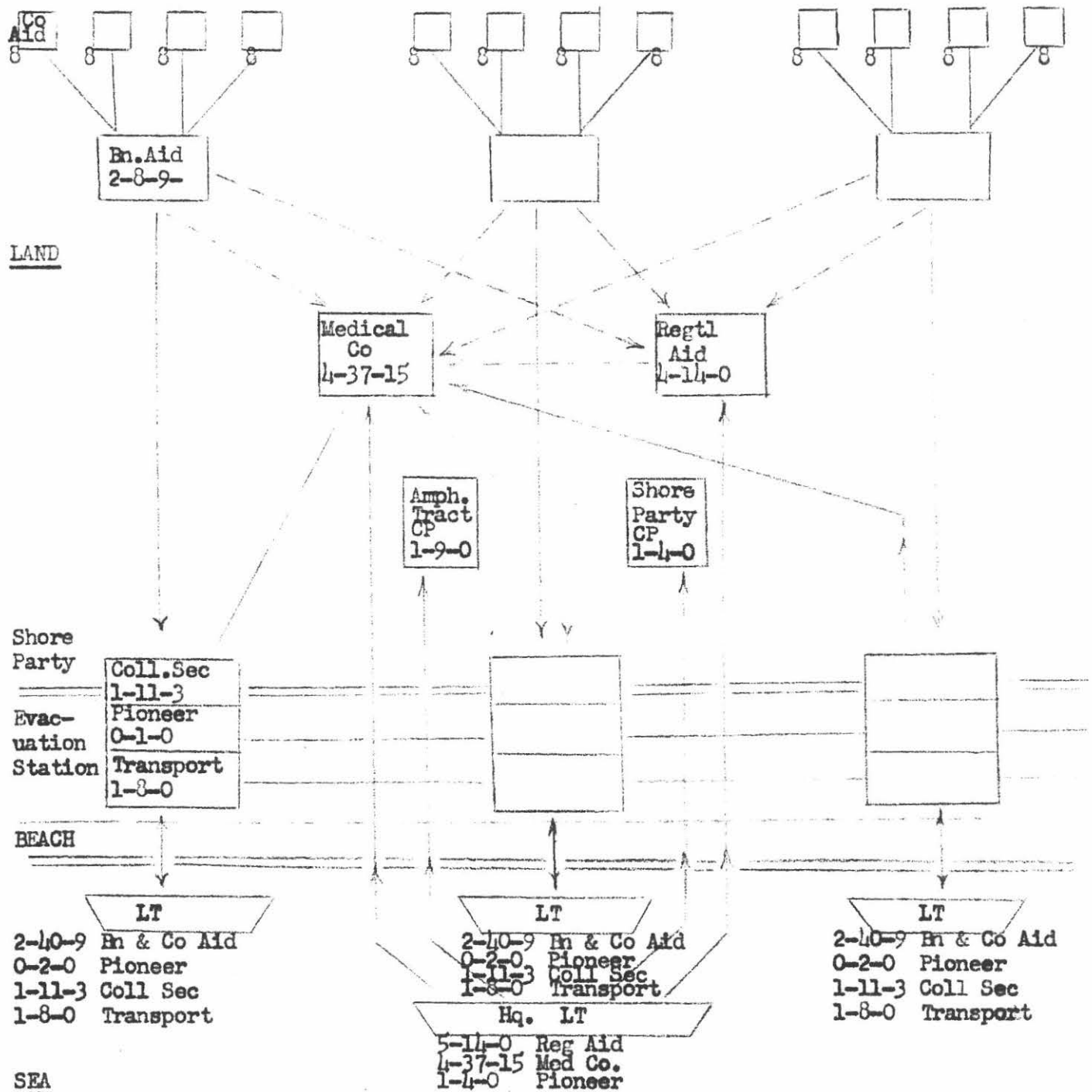
(Note) Certain Med Pers shown under Div Trs may be assigned initial employment with CTs.

ORGANIZATION:	CT					DIV TRS				
	:Med:	HCO:	DENT:	CORPS:	MAR-:	:MED:	HCO:	DENT:	CORPS:	MAR-:
	: 0 :	: 0 :	MEN :	INES :		: 0 :	: 0 :	MEN :	INES :	
INF REGT:	:	:	:	:	:	:	:	:	:	:
Regtl Hq	: 2 :	:	1 :	9 :	:	:	:	:	:	:
Regtl Wpns Co	:	:	:	5 :	:	:	:	:	:	:
Bn Hq	: 2 :	:	:	16 :	9 :	:	:	:	:	:
Rifle Co	:	:	:	8 :	:	:	:	:	:	:
ARTY REGT:	:	:	:	:	:	:	:	:	:	:
Regtl Hq	:	:	:	:	:	: 1 :	:	1 :	9 :	:
105 MM Bn Hq	:	:	:	:	:	: 1 :	:	:	3 :	:
105 MM Firing:	:	:	:	:	:	:	:	:	:	:
Btry	:	:	:	:	:	:	:	:	2 :	:
75 MM Bn Hq	: 1 :	:	:	3 :	:	:	:	:	:	:
75 MM Firing	:	:	:	:	:	:	:	:	:	:
Btry	:	:	:	2 :	:	:	:	:	:	:
ENGR REGT:	:	:	:	:	:	:	:	:	:	:
*Regtl Hq	:	:	:	:	:	: 2 :	:	1 :	7 :	:
1st Bn Hq	:	:	:	:	:	: 1 :	:	:	3 :	:
1st Bn Co	:	:	:	2 :	:	:	:	:	:	:
2nd Bn Co	: 1 :	:	:	11 :	:	:	:	:	:	:
3rd Bn Hq	:	:	:	:	:	: 2 :	:	1 :	5 :	:
3rd Bn Co	:	:	:	1 :	:	:	:	:	:	:
SPL TRS:	:	:	:	:	:	:	:	:	:	:
Hq Bn:-	:	:	:	:	:	:	:	:	:	:
Div Surgeon	:	:	:	:	:	: 1 :	1 :	:	1 :	:
Bn Hq	:	:	:	:	:	: 1 :	:	1 :	4 :	:
Sig Co	:	:	:	:	:	:	:	:	2 :	:
MP Co	:	:	:	:	:	:	:	:	2 :	:
*Mal Con Unit:	:	:	:	:	:	: 2 :	2 :	:	12 :	:
Spl Wpns BnHq:	:	:	:	:	:	: 2 :	:	:	6 :	:
AT Btry	:	:	:	2 :	:	:	:	:	:	:
AA Btry	:	:	:	:	:	:	:	:	2 :	:
Tk Bn Hq	:	:	:	:	:	: 1 :	:	:	3 :	:
Tk Co	:	:	:	2 :	:	:	:	:	:	:
Sct Cb Hq	:	:	:	:	:	:	:	:	2 :	:
SERV TRS:	:	:	:	:	:	:	:	:	:	:
Serv Bn Hq	:	:	:	:	:	: 1 :	:	:	3 :	:
Ord Co Hq	:	:	:	:	:	:	:	:	2 :	:
S&S Co Hq	:	:	:	:	:	:	:	:	2 :	:
Gr Reg Plat	:	:	:	2 :	:	:	:	:	3 :	:
AmphTracBnHq	:	:	:	:	:	: 1 :	:	:	3 :	:
Trac	:	:	:	2 :	:	:	:	:	:	:
H&S Mt Bn	:	:	:	:	:	: 1 :	:	:	3 :	:
MT Co	:	:	:	2 :	:	:	:	:	:	:
Med Bn Hq	:	:	:	:	:	: 4 :	:	:	12 :	16 :
Med Cos	: 1 :	:	:	11 :	3 :	: 5 :	1 :	1 :	70 :	25 :
Hosp Sec	: 2 :	1 :	1 :	37 :	15 :	:	:	:	:	:

\* SPLIT TWO SECTIONS FOR EMBARKATION

ANNEX "A" TO SOP

(CON'T)

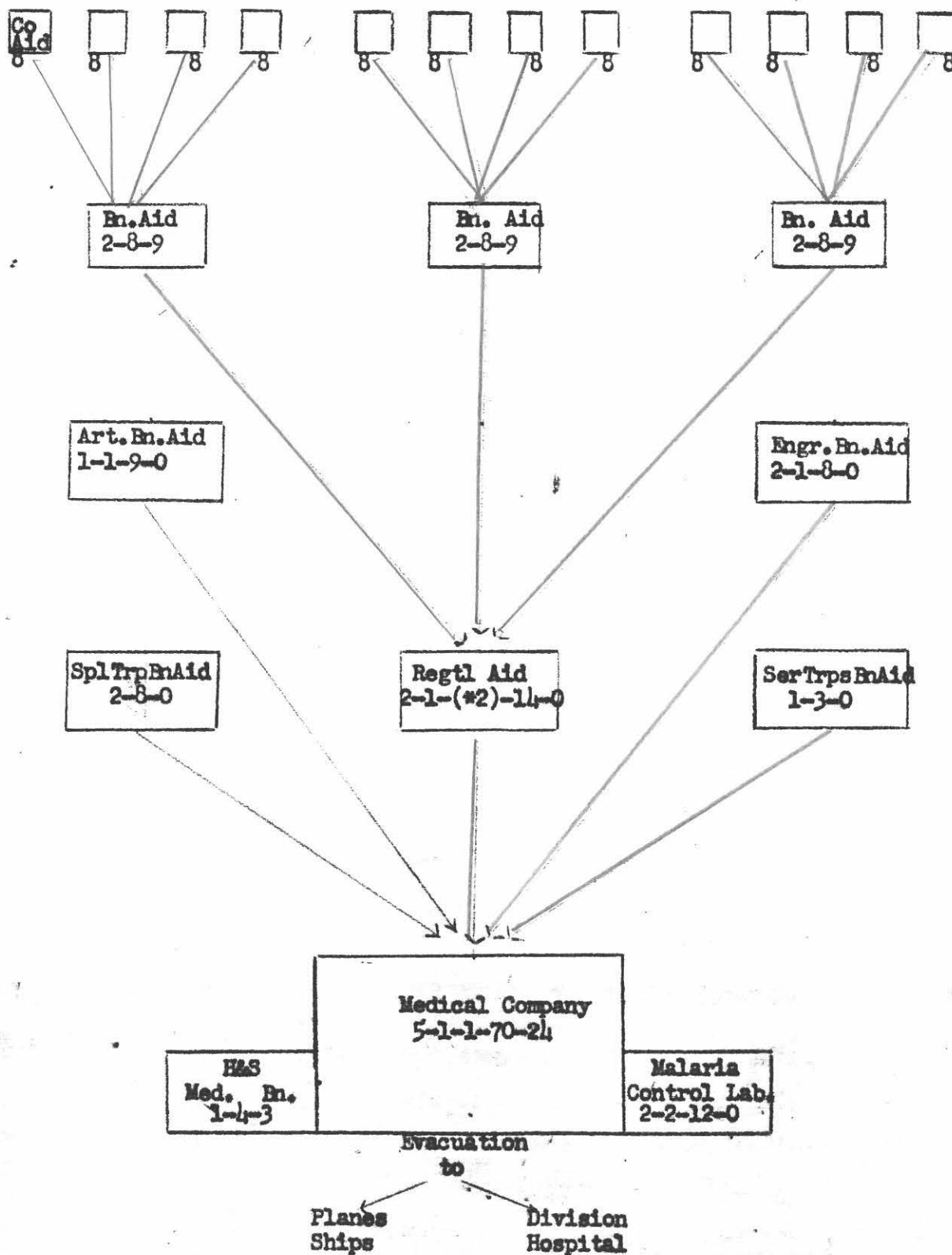


Additional medical personnel of Artillery, Engineer, Special & Service. Troops will be allotted to CTs by Division.

All Dental Officers remain on board AP's and disembark with the medical companies.

ANNEX "A" TO SOP

(CONT)



(#2) Chaplains